

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte ADLAI H. SMITH, BRUCE B. McARTHUR,  
and ROBERT O. HUNTER, JR.

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Appeal No. 97-0544  
Application No. 08/177,108<sup>1</sup>

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ON BRIEF

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Before HAIRSTON, BARRETT, and BARRY, Administrative Patent Judges.

BARRY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the final rejection of claims 16-30. We affirm.

BACKGROUND

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<sup>1</sup> The application was filed on January 3, 1994.

The invention at issue in this appeal relates to the manufacture of nozzles for ink-jet printers. More specifically, the invention generates an array of ink-jet nozzles in a substrate. The invention includes a laser, which is output through an alignment path; an expansion telescope; and a scanner. Beam division optics are used with the scanner to divide-out a plurality of beams and scan simultaneously a respective plurality of computer-generated holograms (CGHs). The CGHs are configured and scanned so that the generated image produces ink-jet nozzles having precise dimensions and alignment.

Claim 16, which is representative for our purposes, follows:

16. In a method for ablating of [sic] a matrix of nozzles on a substrate with controlled nozzle shapes and controlled center to center spacing from a beam of coherent light of a specific frequency for producing at least one nozzle array on the substrate, said method including the steps of:

providing a plurality of masks, each said mask configured in a plane having a plurality of subapertures with each subaperture containing at least a portion of a computer generated hologram for producing converging coherent light of the specific frequency from the subaperture with image information from the subaperture to form a real

image at a working distance from the mask having a profile for ablating the nozzles of specific shape and location on the substrate;

holding the substrate at the working distance from the masks;

holding the plurality of masks overlying the substrate to register the real images of the subapertures to the substrate to pattern the nozzles;

dividing the coherent light of the specific frequency into multiple beams with one the beam [sic]

intersecting each mask at at [sic] least one subaperture; and,

scanning the coherent light source of the specific frequency for simultaneously causing each said beam of the multiple beams at each said mask to simultaneously scan a plurality of subapertures at least along one direction in the plane of the mask to produce on [sic] the substrate nozzles.

The references relied on in rejecting the claims follow:

Daly 7, 1971	3,626,141	Dec.
Dorfman et al. (Dorfman) 15, 1994	5,294,567	Mar.
	(filed Oct. 8,	
1993)		
Schantz et al. (Schantz) 19, 1994	5,305,018	Apr.
	(filed Mar. 9,	
1992)		
Smith et al. (Smith) 1994	5,328,785	Jul. 12,
	(filed Feb. 10,	
1992)		

Mori et al. (Mori)  
1991  
(European Patent Application)

0420574A2

Apr. 3,

Omar  
22, 1993  
(European Patent Application)

0561302A1

Sep.

"The Applications of Holography," Caulfield et al.  
(Caulfield), Wiley-Interscience, © 1970, pp. 80-83.

Claims 16-30 stand rejected under 35 U.S.C. § 112 as indefinite. Claims 16-22, 24, and 26-29 stand rejected under 35 U.S.C. § 103 as obvious over Smith in view of Dorfman, Shantz, and Caulfield. Claims 16, 23, and 25 stand rejected under 35 U.S.C. § 103 as obvious over Smith in view of Dorfman, Shantz, Caulfield, and Daly. Claims 16, 23, and 30 stand rejected under 35 U.S.C. § 103 as obvious over Smith in view of Dorfman, Shantz, and Caulfield further in view of Mori or Omar. Rather than repeat the arguments of the appellants or examiner in toto, we refer the reader to the brief and the answer for the respective details thereof.

OPINION

In reaching our decision in this appeal, we considered the subject matter on appeal and the rejections and evidence advanced by the examiner. We also considered the arguments of the appellants and examiner. After considering the entire record before us, we are not persuaded that the examiner erred in rejecting claims 16-30 under 35 U.S.C. § 112. We are persuaded, however, that the examiner erred in rejecting claims 16-30 under 35 U.S.C. § 103. Accordingly, we affirm. Our opinion addresses the indefiniteness of the claims and the obviousness thereof seriatim.

#### Indefiniteness of the Claims

Regarding the indefiniteness of claims 16-30, the appellants concede the propriety of the rejection. (Appeal Br. at 2.) Therefore, we affirm the rejection pro forma. Next, we address the obviousness of the claims.

#### Obviousness of the Claims

Regarding the obviousness of claims 16-30, the appellants argue, "It is a fact that the gratings in Smith are preferably computer-generated holograms. These holograms, however, do

not bring the light to a focus and, at the same time, contain image

information for ablation. They are merely scattering-type masks.

They require condensing objects to image the mask to effect ablation." (Appeal Br. at 10.) "The examiner disagrees, noting that these **holographic** articles both function as diffractive optical masks. The examiner does agree that the image recorded in these masks is different and that this accounts for the relay lens used in the teachings of Smith et al.. [sic]" (Examiner's Answer at 12.) We agree with the appellants.

The examiner errs in interpreting the scope of the claims. Independent claim 16 specifies in pertinent part "a computer generated hologram for producing converging coherent light of the specific frequency from the subaperture with image information from the subaperture to form a real image at a working distance from the mask having a profile for ablating the nozzles of specific shape and location on the substrate ...." Giving the claim its broadest reasonable

interpretation, it requires the CGH to do more than form an image on a substrate. The claim also requires the CGH to produce converging, coherent light.

We note three principles from In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). (1) In rejecting claims under 35 U.S.C. § 103, the patent examiner bears the initial burden of establishing a prima facie case of obviousness. (2) A prima facie case is established when teachings from the prior art would appear to have suggested the claimed subject matter to a person of ordinary skill in the art. (3) If the examiner fails to establish a prima facie case, an obviousness rejection will be reversed.

The examiner fails to show a teaching or suggestion of a CGH that both produces converging, coherent light and forms an image on a substrate as claimed. To the contrary, he admits that Smith's phase masks, on which he reads the claimed CGH, "have the advantage of being *diffractive* elements ...." (Examiner's Answer at 4 (emphasis added).) Similarly, the examiner admits, "The benefit of the use of computer generated

holograms (CGHs) in providing *diffractive* means masking the exposure ... is clearly taught within Smith ...." (Id. at 6 (emphasis added).) Smith, for its part, teaches that its phase mask 40 scatters undesired light 41 while transmitting diffused light 43. Col. 5, 11, 9-12. Rather than producing converging, coherent light as claimed, the reference's masks produce diverging and scattered light.

Neither the addition of Dorfman, Shantz, Caulfield, Daly, Mori, nor Omar cures the defect of Smith. The examiner has not identified anything in these references or the prior art as a whole that teaches or would have suggested a CGH that produces converging, coherent light and forms an image on a substrate as recited in independent claim 16 and its dependent claims 17-30. For the foregoing reasons, the examiner has not established a prima facie case of obviousness. Therefore, we reverse the rejection of claims 16-22, 24, and 26-29 under 35 U.S.C. § 103 as obvious over Smith in view of Dorfman, Shantz, and Caulfield; the rejection of claims 16, 23, and 25 under 35 U.S.C. § 103 as obvious over Smith in view of Dorfman, Shantz, Caulfield, and Daly; and the rejection of claims 16, 23, and



30 under 35 U.S.C. § 103 as obvious over Smith in view of Dorfman, Shantz, and Caulfield further in view of Mori or Omar.

CONCLUSION

To summarize, the examiner's rejection of claims 16-30 under 35 U.S.C. § 112 is affirmed. His rejections under 35 U.S.C. § 103, however, are reversed.

No period for taking subsequent action concerning this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

KENNETH W. HAIRSTON	)	
Administrative Patent Judge	)	
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	)	
	)	
	)	BOARD OF PATENT
LEE E. BARRETT	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES

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LANCE LEONARD BARRY )  
Administrative Patent Judge )

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APPEAL NO. 97-0544 - JUDGE BARRY  
APPLICATION NO. 08/177,108

APJ BARRY

APJ HAIRSTON

APJ BARRETT

DECISION: **AFFIRMED-IN-PART**

Prepared by: Gloria Henderson

**DRAFT TYPED:** 01 Dec 00

**FINAL TYPED:**

Gloria, note the following instructions:

Do NOT change style of citations.

Do insert claim and reference(s).

Do check quotations.

Do proofread.